# Types of Research

A step-by-step, student-friendly lecture on research classifications, purposes, approaches, and applications

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**University Lecture Slides**

# Lecture Overview

What this lecture covers and how the sections connect.

**1**

Foundations
Core definitions and why research types matter

**2**

Classifications
Types by purpose, approach, objective, design, time, and data source

**3**

Application
Examples, scenarios, and how to choose an appropriate type

**4**

Quality
Ethics, limitations, common mistakes, and best practices

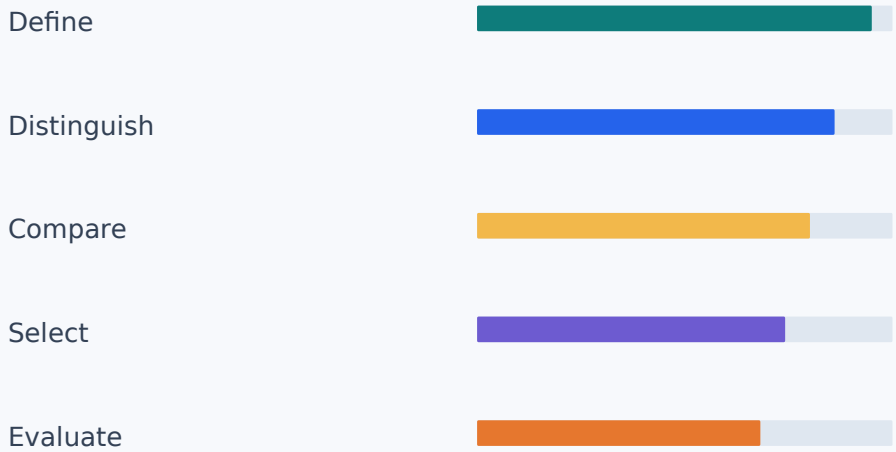
*Research type is not a label to memorize; it is a design choice that should match the research question.*

# Learning Objectives

By the end of this lecture, students should be able to:

1. Define major types of research using clear academic language.
2. Distinguish research types by purpose, approach, objective, time, data source, and design.
3. Compare qualitative, quantitative, and mixed methods research.
4. Select an appropriate research type for a given problem or question.
5. Identify strengths, limitations, ethical concerns, and common student mistakes.
6. Apply research classifications to practical examples from different disciplines.

## Measurable skills




These objectives can be assessed through short-answer questions, design-selection tasks, and research proposal exercises.

# Introduction to Types of Research

Research types help scholars organize inquiry and make suitable methodological decisions.

In academic work, research is a systematic process used to investigate questions, generate knowledge, solve problems, or evaluate evidence. “Types of research” refers to the ways studies are classified according to their purpose, design, data, timing, and method of inquiry.

Clarifies what kind of knowledge a study aims to produce.
Guides choices about data collection, sampling, analysis, and interpretation.
Helps readers judge whether conclusions are appropriate for the evidence.
Supports transparent research proposals, theses, dissertations, and journal articles.

## Why it matters

Research Problem
What needs to be understood?

Research Type
What design fits the problem?

Research Evidence
What data will support the answer?

Research Claim
What conclusion is justified?

# Key Definitions

Important terms used throughout the lecture.

Research type
A category that describes the purpose, approach, design, source of data, or timing of a study.

Research design
The overall plan used to answer the research question with appropriate evidence.

Methodology
The logic and strategy behind the selection of methods and procedures.

Method
A specific technique for collecting or analyzing data, such as surveys, interviews, or experiments.

Research approach
The broad orientation of inquiry, commonly qualitative, quantitative, or mixed methods.

Evidence
Information used to support findings, interpretations, and conclusions.

# Background and Academic Context

Research classifications developed to support systematic inquiry across disciplines.

Modern research methodology commonly classifies studies according to the kind of question asked, the kind of data used, and the kind of evidence required. In research and development statistics, the Frascati Manual distinguishes basic research, applied research, and experimental development as major activity categories.

1

Philosophy of science
How knowledge is justified

2

Research design
How questions become studies

3

Data and methods
How evidence is collected

4

Ethics and quality
How participants and integrity are protected

**Research type acts as a bridge between the academic purpose of a study and the practical decisions needed to conduct it.**

# Classification Map of Research Types

One study can belong to several categories at once.

Examples: basic/applied • exploratory/descriptive • qualitative/quantitative • experimental/non-experimental • cross-sectional/longitudinal • primary/secondary

# Types by Purpose

What is the study trying to achieve?

| Type | Main Aim | Simple Example |
| --- | --- | --- |
| Basic research | Generate new knowledge or theory without an immediate practical application. | Studying how memory works under different attention conditions. |
| Applied research | Solve a specific practical problem or inform decisions. | Testing strategies to reduce employee turnover in a company. |
| Experimental development | Create or improve products, processes, or systems using existing knowledge. | Developing a prototype learning app based on usability evidence. |

## Student note

Purpose-based categories describe the intended contribution of the study, not the data collection method. A basic study can still use surveys or experiments; an applied study can still use interviews or documents.

# Types by Research Objective

What kind of answer is needed?

Exploratory
Used when a topic is new, unclear, or under-researched. It helps identify ideas, variables, and questions.

Descriptive
Used to describe characteristics, patterns, frequencies, or experiences without necessarily explaining causes.

Explanatory / Analytical
Used to explain relationships, test causal assumptions, or analyze why something happens.

## Typical progression in a field

1. **Explore**
2. **Describe**
3. **Explain**
4. **Predict**
5. **Evaluate**

# Types by Research Approach

How will the study understand or measure the phenomenon?

| Approach | Focus | Common Data | Typical Output |
|---|---|---|---|
| Qualitative | Meaning, experience, context, process | Interviews, observations, documents | Themes, narratives, concepts |
| Quantitative | Measurement, variables, patterns, relationships | Surveys, tests, records, experiments | Statistics, estimates, models |
| Mixed methods | Integration of qualitative and quantitative evidence | Both narrative and numeric data | Integrated explanation or design |

**Approach is not about “easy versus hard.” It is about fit between the research question and the evidence needed.**

# Qualitative Research

Understanding meanings, experiences, contexts, and processes.

Uses non-numerical data such as words, observations, images, or documents.
Common in social sciences, education, health, psychology, management, and humanities.
Often uses interviews, focus groups, ethnography, case studies, and document analysis.
Analysis commonly identifies themes, categories, patterns, or interpretations.

## Best suited for questions like:

*“How do first-year students experience academic stress?”*

*“What barriers do nurses face when adopting a new system?”*

*“How do entrepreneurs describe risk in early-stage startups?”*

**Output: rich descriptions and interpretation rather than only numerical summaries.**

# Quantitative Research

Measuring variables and analyzing numerical patterns.

Uses numerical data to describe, compare, predict, or test relationships.
Often uses structured surveys, experiments, tests, sensors, records, or datasets.
Requires careful measurement, sampling, statistical analysis, and interpretation.
Findings are commonly reported as estimates, percentages, correlations, group differences, or models.

## Variable logic

Independent variable
Possible cause or predictor

Dependent variable
Outcome or response

Control variable
Factor held constant or adjusted

Measurement scale
How a variable is recorded

**Example: Does study time predict exam scores among undergraduate students?**

# Mixed Methods Research

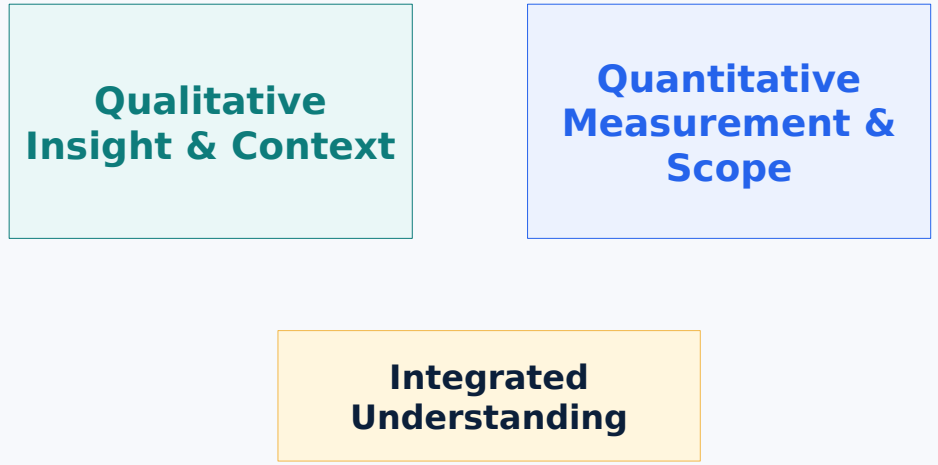
Combining qualitative and quantitative evidence in one study.

Mixed methods research intentionally integrates qualitative and quantitative approaches. The value is not simply using two tools; it comes from connecting evidence so that each part strengthens the interpretation.

Convergent
Collect both types of data in parallel and compare or merge results.

Explanatory sequential
Start with quantitative results, then use qualitative data to explain them.

Exploratory sequential
Start qualitatively, then build or test a quantitative instrument or model.

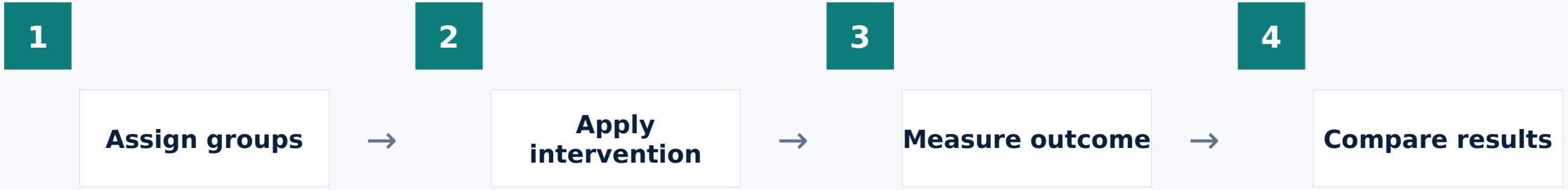



**Use when one type of evidence alone cannot fully answer the research question.**

# Experimental Research

Testing cause-and-effect under controlled conditions.

Experimental research involves manipulating an independent variable and observing its effect on a dependent variable, usually with control procedures such as random assignment or comparison groups.




| Feature | Why it matters |
| --- | --- |
| Manipulation | Allows the researcher to introduce a treatment or condition. |
| Control | Reduces alternative explanations for observed effects. |
| Randomization | Helps create comparable groups when feasible. |
| Comparison | Shows whether outcomes differ between conditions. |

# Quasi-Experimental and Non-Experimental Research

Not all important questions can be answered with true experiments.

| Type | Main Features | Example |
|---|---|---|
| Quasi-experimental | Intervention or comparison occurs, but random assignment is absent or limited. | Comparing two existing classrooms using different teaching methods. |
| Non-experimental | Variables are observed without manipulation by the researcher. | Surveying workplace stress and job satisfaction. |
| Observational | Natural behavior or conditions are recorded systematically. | Observing patient flow in a hospital waiting room. |
| Correlational | Relationships among variables are examined statistically. | Testing whether sleep hours relate to exam performance. |

**Important caution: correlation does not automatically prove causation. Strong claims require appropriate design, temporal order, controls, and theoretical justification.**

# Types by Time Dimension

When and how often is data collected?

| Type | Data Collection Pattern | Strength | Limitation |
|---|---|---|---|
| Cross-sectional | One point in time | Efficient for describing current patterns | Cannot show change over time |
| Longitudinal | Repeated over time | Tracks change, development, or trends | Requires more time and resources |
| Retrospective | Looks backward using records or memory | Useful when events already occurred | May suffer from missing data or recall bias |
| Prospective | Follows participants/events into the future | Can establish time order | May face attrition or delays |

## Visual timeline

retrospective ← cross-sectional at one point → prospective / longitudinal

# Types by Data Source

Where does the evidence come from?

## Primary Research

Collects original data directly for the current study.
Examples: interviews, surveys, experiments, observations, tests.
High fit to the research question, but often time-consuming.

## Secondary Research

Uses data or sources already created by others.
Examples: census data, institutional records, journal articles, reports.
Efficient and broad, but may not perfectly match the question.

**Data source choice affects cost, control, ethical procedures, data quality, and the credibility of conclusions.**

# Specialized and Commonly Used Research Types

Additional labels often used in proposals and journal articles.

Case study
In-depth analysis of one case or a small number of cases in context.

Action research
Researcher and participants work together to improve practice.

Evaluation research
Assesses the value, effectiveness, or implementation of a program.

Theoretical research
Develops or refines theory using logic and existing literature.

Conceptual research
Clarifies concepts, models, frameworks, and relationships.

Empirical research
Uses observed or measured evidence from the real world.

**Tip: Use specialized labels only when they genuinely describe the design and evidence of the study.**

# Step-by-Step Process: Choosing a Research Type

A practical decision sequence for students and beginning researchers.

1. Start with the research problem and purpose.
2. Write the main research question clearly.
3. Decide whether the study needs meanings, measurements, or both.
4. Identify whether description, explanation, evaluation, or development is needed.
5. Choose a feasible design, time frame, participants, and data source.
6. Check ethics, access, resources, and expected quality of evidence.
7. State and justify the research type in the proposal.

## Decision checkpoint

What do I need to know?

What kind of evidence can answer it?

Can I collect that evidence ethically?

What conclusions will the design support?

# Visual Process: From Question to Research Type

A research type should follow the question, not the other way around.

Question
Why are rural students less likely to complete online courses?

Evidence need
Experiences + barriers + patterns in completion data

Possible type
Mixed methods, explanatory sequential, applied research

# Practical Examples Across Disciplines

How research types appear in different academic fields.

| Discipline | Example Topic | Suitable Research Type |
|---|---|---|
| Social sciences | Youth political participation in urban areas | Descriptive survey + qualitative interviews |
| Business & management | Impact of remote work on employee productivity | Applied, quantitative, correlational or mixed methods |
| Education | Effect of formative feedback on writing performance | Quasi-experimental or action research |
| Health sciences | Patient experiences with telemedicine | Qualitative phenomenological or mixed methods |
| Psychology | Relationship between sleep quality and anxiety | Quantitative correlational / longitudinal |
| Information technology | Usability of a new mobile banking app | Evaluation research + usability testing |

**In every discipline, the type is selected because it fits the question and available evidence.**

# Research Example: Applying Research Type in a Study

A complete scenario showing classification in practice.

| Element | Scenario Detail |
| --- | --- |
| Research topic | Use of AI writing tools among postgraduate students. |
| Research problem | Universities need to understand how students use AI tools and whether use relates to writing confidence and academic integrity concerns. |
| Research question | How do postgraduate students use AI writing tools, and what factors are associated with responsible use? |
| Population / participants | Master’s and PhD students in one university. |
| Data collection | Online survey plus follow-up semi-structured interviews. |
| Data analysis | Descriptive statistics, correlations, and thematic analysis of interview transcripts. |
| Research type | Applied, mixed methods, descriptive and analytical, primary-data study. |
| Expected interpretation | Survey results show broad patterns; interviews explain meanings, motivations, and concerns behind those patterns. |

# Advantages of Understanding Research Types

Why this knowledge improves research quality.

Better alignment
Research questions, methods, and evidence fit together logically.

Clearer proposals
Supervisors and reviewers can see why the design was chosen.

Stronger interpretation
Conclusions are limited to what the design can support.

Improved efficiency
Students avoid collecting unnecessary or unsuitable data.

Ethical clarity
Participant risks, consent, privacy, and data handling are planned earlier.

Cross-disciplinary communication
Researchers can explain studies to readers from other fields.

**Strong methodology begins with a clear understanding of what kind of study is being conducted.**

# Limitations and Challenges

Common concerns when classifying research types.

Categories can overlap, which may confuse students looking for one “correct” label.
Textbooks and disciplines sometimes use different terminology for similar designs.
A label alone does not guarantee methodological quality.
Some research problems require hybrid or adaptive designs.
Practical constraints may force compromise between ideal design and feasible design.
Ethical or access limitations may prevent experiments, longitudinal tracking, or sensitive data collection.

## How to respond

Define the terms you use.

Justify choices using the research question.

Acknowledge design limitations openly.

Avoid overstating what the study proves.

# Common Mistakes Students Make

Avoid these problems when explaining research type.

Starting with a preferred method
Choosing “survey” or “interview” before writing a clear question.

Confusing method with type
Treating data collection tools as if they are complete designs.

Claiming causation too quickly
Using correlational or cross-sectional data to make causal claims.

Using vague labels
Writing “descriptive research” without explaining what is being described.

Ignoring feasibility
Choosing a longitudinal or experimental design without access, time, or ethical approval.

Weak justification
Naming a type without showing why it fits the research problem.

# Best Practices for Using Research Types Correctly

Practical recommendations for academic writing and design.

1. Begin with the research problem, then choose the design.
2. State the research type in a precise sentence in the methodology section.
3. Use definitions from credible research methods sources or your discipline.
4. Explain why the chosen type fits the research question, participants, and data.
5. Separate research approach, design, data source, and time dimension when needed.
6. Be honest about limitations and avoid claims that exceed the design.
7. Connect type of research to sampling, tools, analysis, and ethics.

## Useful template sentence

*“This study uses a [type] design because the research question requires [kind of evidence] to understand/measure/evaluate [phenomenon].”*

## Example

“This study uses an applied mixed methods design because the question requires both measurable patterns and student explanations of their experiences.”

# Comparison Table: Major Research Types

A compact comparison of common categories.

| Category | Common Types | Best Used When | Typical Evidence |
|---|---|---|---|
| Purpose | Basic, applied, experimental development | Clarifying the intended contribution | Theory, problem-solving, prototypes |
| Objective | Exploratory, descriptive, explanatory | Determining the kind of answer needed | Ideas, profiles, relationships, causes |
| Approach | Qualitative, quantitative, mixed | Choosing the nature of evidence | Words, numbers, or integrated data |
| Design | Experimental, quasi-experimental, non-experimental | Testing causal claims or observing naturally | Interventions, comparisons, observations |
| Time | Cross-sectional, longitudinal, retrospective, prospective | Studying a point in time or change over time | Single or repeated measurements |
| Data source | Primary, secondary | Deciding whether to collect new data or use existing sources | Surveys, interviews, records, datasets |

# Ethical Considerations

Research type affects ethical planning and participant protection.

Informed consent
Participants should understand the study purpose, procedures, risks, benefits, and voluntary nature.

Confidentiality and privacy
Data must be protected, anonymized when appropriate, and used only for approved purposes.

Risk and benefit
Researchers should minimize harm and consider whether benefits justify any burden.

Fair participant selection
Sampling should avoid unjust exclusion, exploitation, or coercion.

Transparency
Methods, limitations, conflicts of interest, and data handling should be reported honestly.

Bias and integrity
Avoid selective reporting, fabricated data, plagiarism, and unsupported claims.

**Human-subject research should follow relevant institutional review, national regulations, and recognized ethical principles.**

# Activity: Classify a Research Study

A short individual or group exercise for classroom use.

## Activity objective

Practice choosing and justifying research types using a realistic topic.

## Instructions

1. Choose one topic from your discipline.
2. Write one research question.
3. Classify the study by purpose, objective, approach, design, time, and data source.
4. Write a two-sentence justification.

## Expected outcome

Students should be able to explain not only what type of research they selected, but why that type matches the research question and evidence needed.

## Sample prompt

*“Does the use of online quizzes improve student engagement in introductory statistics courses?”*

Suggested answer: applied, explanatory, quantitative or mixed methods, quasi-experimental, primary-data, possibly longitudinal.

# Discussion Questions

Use these prompts for classroom discussion or online forums.

1. Why can one study belong to more than one research type?
2. When would qualitative research be more appropriate than quantitative research?
3. What kinds of questions require longitudinal data?
4. Why is it risky to claim causation from cross-sectional survey data?
5. How can mixed methods strengthen a study’s interpretation?
6. What ethical issues are most important in your own discipline?
7. How would you classify your current thesis or research project?

# Knowledge Check

Answer individually, then compare with a partner.

1. Which type of research is mainly used to generate new knowledge without immediate application?

2. A study using interviews to understand patient experiences is most likely which approach?

3. What research type tracks the same participants across multiple time points?

4. Why does correlation not automatically prove causation?

5. Name one difference between primary and secondary research.

6. Which design manipulates an independent variable to observe an effect?

7. What is one advantage of mixed methods research?

8. What ethical principle requires voluntary participation and clear information?

**Answers are provided on the next slide.**

# Knowledge Check: Answer Key

Suggested answers for the previous slide.

1. 1. Basic research.
2. 2. Qualitative research.
3. 3. Longitudinal research.
4. 4. Other variables, timing, and alternative explanations may explain the relationship.
5. 5. Primary research collects new data; secondary research uses existing data or sources.
6. 6. Experimental research.
7. 7. It integrates numerical patterns with contextual explanations or participant meanings.
8. 8. Informed consent / respect for persons.

Instructor tip: Accept equivalent answers when students demonstrate accurate understanding.

# Key Takeaways

The most important points to remember.

1. Research type is multidimensional
   It can describe purpose, objective, approach, design, time, and data source.

2. Fit matters more than labels
   The best type is the one that answers the research question with suitable evidence.

3. Methods and types are not the same
   A survey, interview, or experiment is a method within a broader design.

4. Claims depend on design
   Descriptive, correlational, experimental, and qualitative studies support different conclusions.

5. Ethics is part of design
   Consent, privacy, fairness, transparency, and integrity must be considered early.

# Conclusion

Types of research help convert broad questions into clear and defensible studies.

Understanding research types allows students and scholars to make better methodological decisions. It clarifies the purpose of a study, guides the selection of evidence, improves the quality of research writing, and helps readers understand what conclusions are justified.

## A strong research design should answer three questions:

What is being studied?
Problem & question

What evidence is needed?
Approach & data

What claim is justified?
Design & interpretation

**When research type, research question, and evidence are aligned, the study becomes clearer, stronger, and more credible.**

# References & Thank You

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